

WHAT IS CLAIMED IS:

1. A film-forming device with a substrate rotating mechanism, which comprises:

a susceptor in the form of a circular disk and provided at  
5 the outer periphery with a revolution input section;

a base plate positioned below the susceptor and rotatably retaining the susceptor;

a first rotating mechanism including at least one revolution  
generating section, the revolution generating section rotating  
10 the susceptor at the outer periphery of the susceptor by way of  
imparting a rotating force to the revolution input section;

a plurality of substrate tray retaining sections positioned  
circumferentially around a rotation axis of the susceptor;

a plurality of annular substrate trays provided at the outer  
15 periphery with a rotation input section and rotatably supported  
in the corresponding substrate tray retaining sections;

a second rotating mechanism including a rotation generating  
section, the rotation generating section rotating the substrate  
trays by way of imparting a rotating force to each rotation input  
20 section; and

a plurality of substrates retained in the corresponding  
substrate trays, the substrates being revolved by the rotation  
of the susceptor and rotated by the rotation of the substrate trays  
to apply a certain film-forming process.

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2. A film-forming device with a substrate rotating mechanism according to claim 1, wherein said first rotating mechanism rotatably retains the susceptor via a bearing supported between bearing grooves, each provided at the susceptor and the base plate, and wherein said second rotating mechanism rotatably retains the substrate trays via a bearing supported between bearing grooves, each provided at the substrate trays and the susceptor.

3. A film-forming device with a substrate rotating mechanism according to claim 2, wherein in the first rotating mechanism, the bearing groove of said susceptor and the bearing groove of said base plate are each provided with a horizontal plane and a vertical plane, wherein the bearing groove of said susceptor supports the bearing at an upper support portion and an outer support portion, which position above the bearing and provided in said horizontal and vertical planes, and the bearing groove of the base plate supports the bearing at a lower support portion and an inner support portion, which position below the bearing and provided in said horizontal and vertical planes, and wherein said upper support portion and said lower support portion position at the uppermost position and the lowermost position of the bearing, and the outer support portion and the inner support portion position at both ends of the bearing in the horizontal direction.

4. A film-forming device with a substrate rotating mechanism according to claim 1, wherein each substrate tray retains

the substrate on a substrate support with a film-formation plane of the substrate positioned downward.

5 5. A film-forming device with a substrate rotating mechanism according to claim 2, wherein each substrate tray retains the substrate on a substrate support with a film-formation plane of the substrate positioned downward.

10 6. A film-forming device with a substrate rotating mechanism according to claim 3, wherein each substrate tray retains the substrate on a substrate support with a film-formation plane of the substrate positioned downward.

15 7. A film-forming device with a substrate rotating mechanism according to claim 1 further comprising a temperature control mechanism for adjusting a certain area including the plurality of substrates to a desired temperature distribution, wherein the temperature control mechanism includes at least two temperature control devices, which position both above and below  
20 the susceptor or only above the susceptor.

25 8. A film-forming device with a substrate rotating mechanism according to claim 2 further comprising a temperature control mechanism for adjusting a certain area including the plurality of substrates to a desired temperature distribution, wherein the temperature control mechanism includes at least two

temperature control devices, which position both above and below the susceptor or only above the susceptor.

9. A film-forming device with a substrate rotating  
5 mechanism according to claim 4 further comprising a temperature control mechanism for adjusting a certain area including the plurality of substrates to a desired temperature distribution, wherein the temperature control mechanism includes at least two  
10 temperature control devices, which position both above and below the susceptor or only above the susceptor.

10. A film-forming device with a substrate rotating  
mechanism according to claim 2, wherein the substrate trays, the  
susceptor and the bearings are made from graphite carbon.

11. A film-forming device with a substrate rotating  
mechanism according to claim 1, wherein said susceptor is provided  
at a center portion with an opening, and said opening is covered  
by a cap member, which is made from the material selected from  
20 the group consisting of carbon (C), quartz ( $\text{SiO}_2$ ), molybdenum (Mo), tungsten (W), silicon carbide (SiC), silicon (Si) and gallium arsenide (GaAs).

12. A film-forming device with a substrate rotating  
25 mechanism according to claim 1, wherein said certain film-forming process is a thin-film growth by Metal Organic Chemical Vapor

Deposition (MOCVD) method.

13. A film-forming device with a substrate rotating mechanism according to claim 2, wherein said certain film-forming  
5 process is a thin-film growth by Metal Organic Chemical Vapor Deposition (MOCVD).

14. A film-forming device with a substrate rotating mechanism according to claim 4, wherein said certain film-forming  
10 process is a thin-film growth by Metal Organic Chemical Vapor Deposition (MOCVD).

15. A film-forming device with a substrate rotating mechanism according to claim 7, wherein said certain film-forming  
15 process is a thin-film growth by Metal Organic Chemical Vapor Deposition (MOCVD).

16. A film-forming device with a substrate rotating mechanism according to claim 9, wherein said certain film-forming  
20 process is a thin-film growth by Metal Organic Chemical Vapor Deposition (MOCVD).